

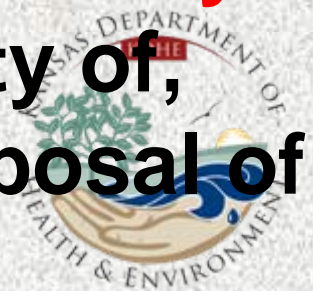
# Lessons learned



**Common violations and best  
practices**

# Regulatory preamble

These regulations state the requirements that shall be applied in the use of all radiation, radiation machines, and radioactive materials to ensure the maximum **protection of the public health and the maximum safety to all** persons at, or in the vicinity of, the place of use, storage, or disposal of sources of radiation.



# **Areas of concern**

## **Radioactive materials**

- **Radiation Safety Officer duties and Radiation Safety Committee meetings**
- **Adequate supervision by authorized users**
- **Training**
- **Radiological surveys, documentation, and personal radiation monitoring**
- **ALARA and whole body and extremity exposures to industrial radiographers, interventional radiologists, and extremity exposures to pharmacy and cyclotron (PET) personnel**



# **Areas of concern**

## **Machine produced radiation**

- **Personal radiation monitoring**
- **Machine performance parameters**
  - mA, time, kVp, HVL, image processing
  - Frequency and timeliness of performance checks/calibrations
- **ALARA in the digital age**
  - dose area



# **Areas of concern**

## **Machine produced radiation**

- **Radiation exposure during fluoroscopic procedures**
  - Regulations require that radiation exposure to the patient be the minimum exposure required to produce images of good diagnostic quality
  - Extremity exposure to worker may be limiting factor
- **Accelerator operation and therapy**
  - Regulatory requirements are complex
  - Requires a Radiation Safety Officer
  - Specific requirements for Medical



# **Radiation Safety Officer**

## **Duties, tasks, responsibilities**

- **Safe use of radioactive material**
- **Training**
- **Personnel monitoring**
- **Hazard evaluation**
- **Incident response**
- **Security of licensed material**
- **Surveys**
- **Inventories**
- **Waste management**
- **Records and reports**



# **Radiation Safety Committee**

## **Responsibilities**

- **Review and approve authorized users, user permits, and license amendments**
- **Review of reports and findings**
- **Conduct or review audits and program reviews**
  - **Radiation safety program (annual)**
  - **Radiation exposure**
  - **ALARA program**
  - **Regulatory quality assurance requirements**



# **Executive management**

## **Roles and responsibilities**

- **Define and support Radiation Safety Officer's authority**
- **Provide open communication with the Radiation Safety Officer and the Radiation Safety Committee**
- **Attend and participate in Radiation Safety Committee meetings**
- **Assess Radiation Safety Officer and the Radiation Safety Committee performance**
- **Conduct required audits**
- **Enforce Radiation Safety policy**



# Authorized user and supervision

Radioactive material shall be used by, or under the supervision of...

- **Definition of supervision should be found in the facility's Radiation Protection Program documentation**
- **In certain circumstances, the regulations specifically define supervision**
- **Types of supervision**
  - Direct**
  - General**
  - Administrative**



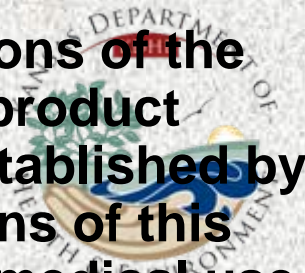
# Authorized user and supervision

**Radioactive material shall be used by, or under the supervision of...**

- **A licensee that permits supervised activities is responsible for the acts and omissions of the supervised individual (Medical use, 10CFR35.27)**
- **Receipt, possession, use, or transfer of byproduct material**

**-Personnel shall receive instruction in the licensee's written radiation protection procedures, written directive procedures, regulations of this chapter, and license conditions with respect to the use of byproduct material**

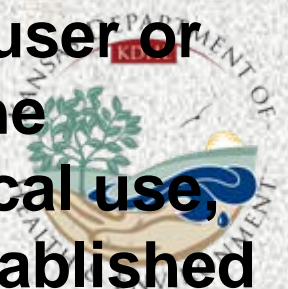
**-The supervised individual shall follow the instructions of the supervising authorized user for medical uses of byproduct material, written radiation protection procedures established by the licensee, written directive procedures, regulations of this chapter, and license conditions with respect to the medical use of byproduct material.**



# Authorized user and supervision

**Radioactive material shall be used by, or under the supervision of...**

- **Preparation of byproduct material for medical use**
  - Instruct the supervised individual in the preparation of byproduct material for medical use, as appropriate to that individual's involvement**
  - Require the supervised individual to follow the instructions of the supervising authorized user or authorized nuclear pharmacist regarding the preparation of byproduct material for medical use, written radiation protection procedures established by the licensee, the regulations of this chapter, and license conditions.**



# Authorized user and supervision

Radioactive material shall be used by, or under the supervision of...

- Any radionuclide or radionuclides possessed under a type A specific license of broad scope shall be only used by, or under the **direct supervision** of, a person or persons approved by a licensee's radiation safety committee.
- Any radionuclide or radionuclides possessed under a type B specific license of broad scope shall...approved by a licensee's radiological safety officer.
- Any radionuclide or radionuclides possessed under a type C specific license of broad scope shall ... who meet the requirements of K.A.R. 28-35-182d(a)
  - B.S. or equivalent
  - 40 h relevant training and experience
  - Established administrative controls and provisions



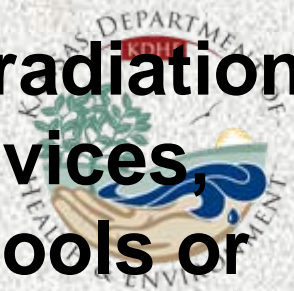
# Personal Supervision

- **Personal supervision means guidance and instruction by the supervisor who is physically present at the job site and who is watching the performance of the operation in such proximity that contact can be maintained and immediate assistance given, as required.**
- **Applies to well loggers and radiographers.**



# Personal Supervision

- **“Logging supervisor” means the individual who uses sources of radiation or provides personal supervision of the utilization of sources of radiation at a well site.**
- **“Radiographer’s assistant” means any individual who, under the personal supervision of a radiographer, uses radiation machines, radiographic exposure devices, sealed sources, or related handling tools or survey instruments in industrial radiography.**



# **Supervision of X-ray systems during healing arts screening**

- **Qualifications of the supervising individual**
- **The extent of supervision and the method of work performance evaluation for operators of X-ray systems shall be specified**



# Good practices

- **Practices that have been proven to reliably lead to a desired result**
- **Usually incorporate innovative approaches and have value in sharing with others**
- **Licensees and registrants are encouraged to draw attention to good practices**
- **Examples**
  - Self audits
  - Monthly issue meetings
  - Use of a program management database
  - Customer satisfaction surveys



# Protect the public and maximum safety to all

